

U.S.S.N. 10/773,916

Filed: February 6, 2004

AMENDMENT AND RESPONSE TO OFFICE ACTION

In the Claims

1. (currently amended) A recombinant host having stably incorporated into the genome a gene encoding a heterologous ~~4-hydroxybutyrate~~ 4-hydroxybutyryl-CoA transferase, wherein the host is selected from the group consisting of a plant, plant cell, and plant component.
2. (currently amended) The host of claim 1 having stably incorporated into its genome both a polyhydroxyalkanoate synthase and a 4-hydroxybutyryl [[4HB]]-CoA transferase.
- 3-4. (canceled)
5. (currently amended) The host of claim 1 further comprising genes expressing enzymes selected from the group consisting of beta-ketothiolase, acetoacetyl CoA reductase, polyhydroxyalkanoate PHA synthase synthases, ~~α -ketoglutarate~~ transaminase, glutamate-succinic semialdehyde transaminase, glutamate dehydrogenase, glutamate decarboxylase, and 4-hydroxybutyrate dehydrogenase.
6. (currently amended) A method for enhancing production of polymers containing 4-hydroxybutyrate in a host comprising
stably incorporating into the genome of the host a gene encoding a 4-hydroxybutyryl [[4HB]]-CoA transferase, wherein the host is selected from the group consisting of a plant, plant cell, and plant component.
7. (currently amended) The method of claim 6 wherein the host has stably incorporated into its genome both a polyhydroxyalkanoate synthase and a 4-hydroxybutyryl [[4HB]]-CoA transferase.

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8. (original) The method of claim 6 further comprising enhancing expression of the heterologous enzyme.

9. (previously presented) The method of claim 8 wherein expression is enhanced by mutating the host followed by providing 4-hydroxybutyrate as a substrate and screening for increased polymer production by the mutated host.

10. (original) The method of claim 6 further comprising providing a host expressing enzymes selected from the group consisting of -ketoglutarate transaminase, glutamate-succinic semialdehyde transaminase, glutamate dehydrogenase, glutamate decarboxylase, 4-hydroxybutyrate dehydrogenase and 4-hydroxybutyryl CoA transferase.

11. (original) The method of claim 6 further comprising providing a host expressing enzymes degrading arginine, glutamine or proline to produce gamma amino butyric acid.

12. (currently amended) A 4-hydroxybutyrate [[4HB]] polymer produced by a recombinant host having stably incorporated into the genome a gene encoding a heterologous enzyme selected from the group consisting of a polyhydroxyalkanoate synthase and a 4-hydroxybutyryl [[4HB]]-CoA transferase, wherein the host is selected from the group consisting of a plant, plant cell, and plant component.

13. (currently amended) A vector comprising an isolated gene encoding a 4-hydroxybutyryl [[4HB]]-CoA transferase under the control of a promoter for enhancing expression of the gene encoding the 4-hydroxybutyryl [[4HB]]-CoA transferase after integration of the promoter and gene encoding the 4-hydroxybutyryl [[4HB]]-CoA transferase into the

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genome of a heterologous host, wherein the host is selected from the group consisting of a plant, plant cell, and plant component.

14. (currently amended) The ~~plant, plant cell, or plant component~~ recombinant host according to claim 1 wherein the plant cell ~~and or~~ plant component ~~are~~ is obtained from said plant, and wherein the said plant is selected from the group consisting of brassica, sunflower, soybean, corn, safflower, flax, palm, coconut, potato, tapioca and cassava.

15. (currently amended) The ~~plant, plant cell, or plant component~~ method according to claim 6 wherein the plant cell ~~and or~~ plant component ~~are~~ is obtained from said plant, and wherein the said plant is selected from the group consisting of brassica, sunflower, soybean, corn, safflower, flax, palm, coconut, potato, tapioca and cassava.

16. (currently amended) The ~~plant, plant cell, or plant component~~ 4-hydroxybutyrate polymer according to claim 12 wherein the plant cell ~~and or~~ plant component ~~are~~ is obtained from said plant, and wherein the said plant is selected from the group consisting of brassica, sunflower, soybean, corn, safflower, flax, palm, coconut, potato, tapioca and cassava.

17. (currently amended) The ~~plant, plant cell, or plant component~~ vector according to claim 13 wherein the plant cell ~~and or~~ plant component ~~are~~ is obtained from said plant, and wherein the said plant is selected from the group consisting of brassica, sunflower, soybean, corn, safflower, flax, palm, coconut, potato, tapioca and cassava.

18. (new) A recombinant expression system comprising a host having stably incorporated into the genome, a gene encoding a heterologous enzyme selected from the group consisting of a polyhydroxyalkanoate synthase and a 4-hydroxybutyryl-CoA transferase, and a

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feedstock comprising a substrate for the polyhydroxyalkanoate synthase and 4-hydroxybutyryl-CoA transferase selected from the group consisting of carbohydrates, succinate, 4-hydroxybutyrate, α -ketoglutarate, and amino acids, wherein the enzyme expression and substrate are in a sufficient amount to produce polyhydroxybutyrate-co-poly-4-hydroxybutyrate or poly-4-hydroxybutyrate.

19. (new) A method for enhancing production of polymers containing 4-hydroxybutyrate in a host comprising stably incorporating into the genome of the host, a gene encoding a heterologous enzyme selected from the group consisting of a polyhydroxyalkanoate synthase and a 4-hydroxybutyryl-CoA transferase;

providing the host with a feedstock comprising a substrate for the polyhydroxyalkanoate synthase and 4-hydroxybutyryl-CoA transferase selected from the group consisting of carbohydrates, succinate, 4-hydroxybutyrate, α -ketoglutarate, and amino acids, wherein the enzyme expression and substrate are in a sufficient amount to produce polyhydroxybutyrate-co-poly-4-hydroxybutyrate or poly-4-hydroxybutyrate.